MAKEBLOCK MUSIC ROBOT KIT V2.0



Catalog

Music Robot Kit V2.0 Introduction

1 What is Music Robot Kit V2.0?

Makeblock Music Robot Kit V2.0 is upgrade featured kit based on Makeblock Music Kit V1.0. It drives the stepper motor to move by ultrasonic sensor detecting the direction of gestures. When the wooden stick moves to the exact position, it hit the xylophone by controlling the electromagnet. You can also control the music robot by upper computer, or DIY the musical scores by programming whatever to play the mixture of styles music.

Here's the updated features than history version.

1.1 Mechanical part

1) Optimize the mechanical structures, easier to get started;

2) Update the mechanical parts, smarter and more beautiful shape;

3) Decrease the space, more accurate motion;

4) Optimize the building instructions, more friendly for beginners.

1.2 Electronic part

1) Update the main board;

2) Update the stepper motor driver module, smaller and more stable;

3) Update the RJ25 Adapter module.

1.3 Software part

1) Update the upper computer software, easier to operate;

2) Add the opening and shielding functions for ultrasonic module, adapt to the different groups needs.

3) Increase the function of update firmware online automatically, improves the user experience.

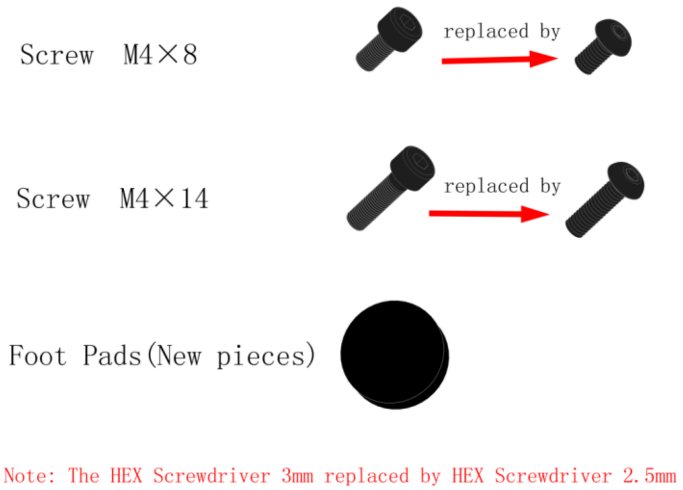
4) Increase "Help" page link, user can find the installation instructions and FAQs

2 Music Robot Kit V2.0 Mechanical Building Guide

There are 9 steps of building the mechanical part, please follow the guide step by step.

2.1 Build the stands

Connect the Beam 0824-96 and Slider 496 by using 8 x socket cap screw M4



NOTE 1 :

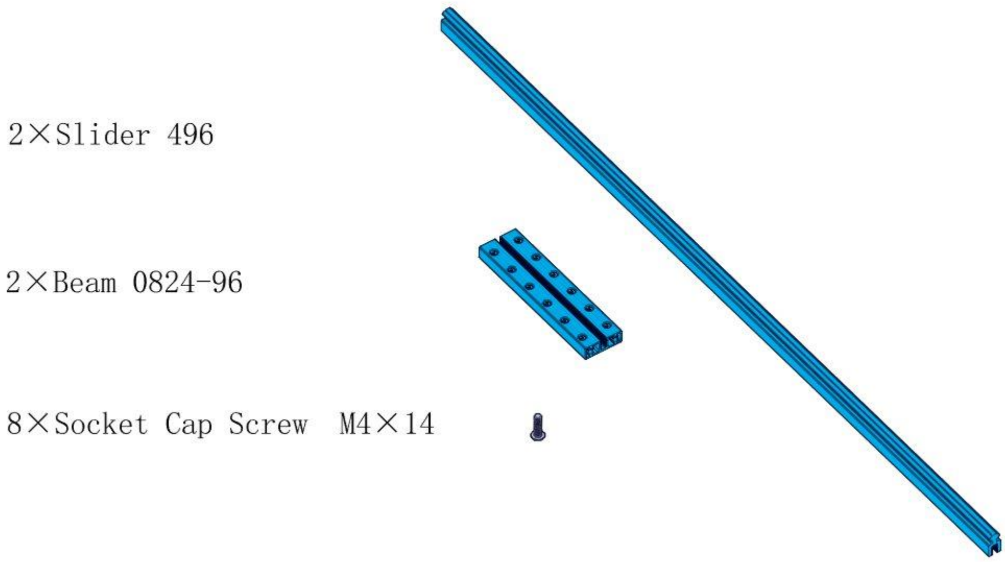


Figure 1

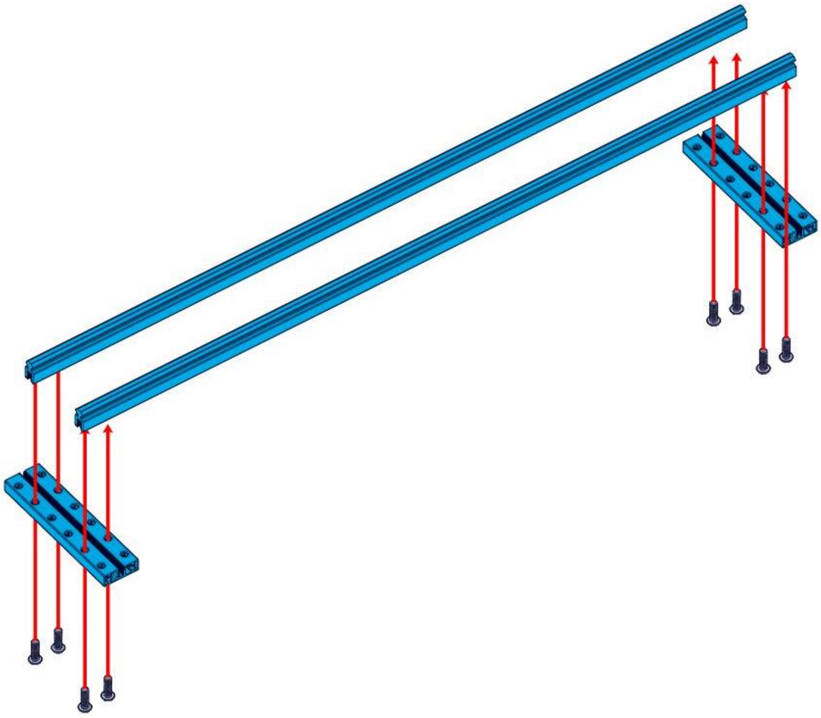


Figure 2

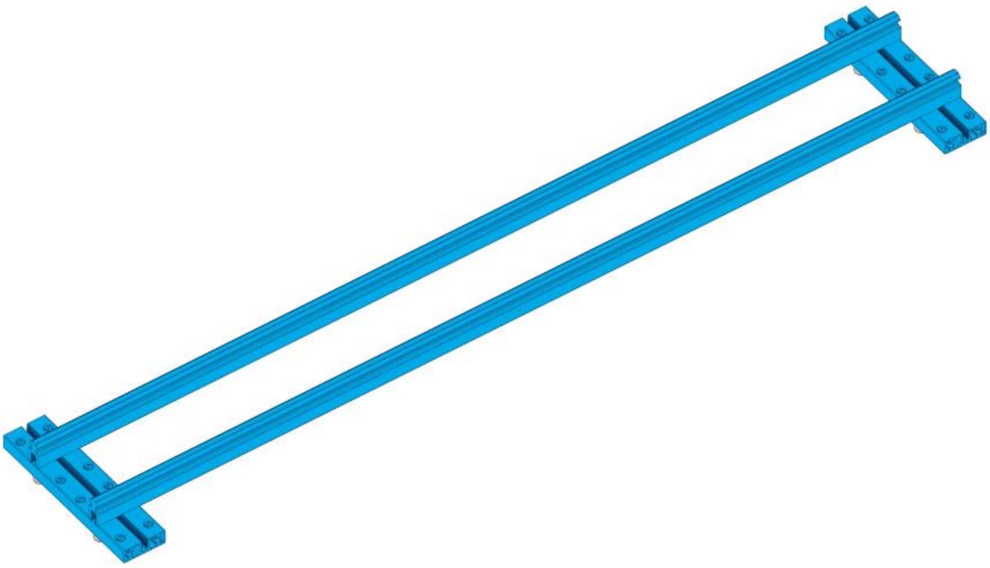


Figure 3

2.2 Install the silde rail

Connect the Plate 7x9 and V-slot Bearing by using Socket Cap Screw M4 as Figure 2-1 shows. When you've done this please make sure put it in the middle of 2 Slides.

(***Note:*** Pay attention of the position of V-slot Bearing is near the Plate 7 x 9.)



Figure 4

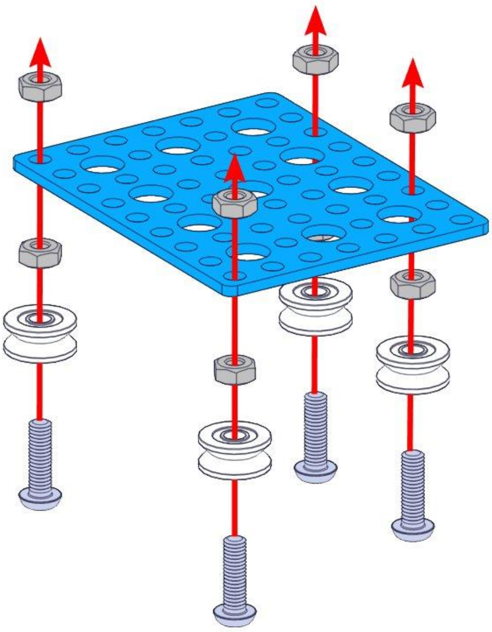


Figure 5

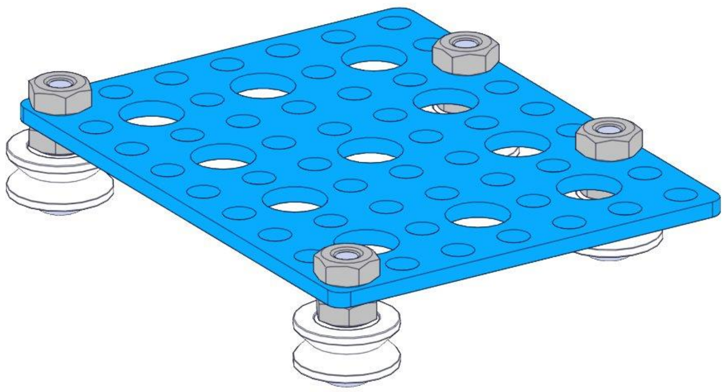


Figure 6

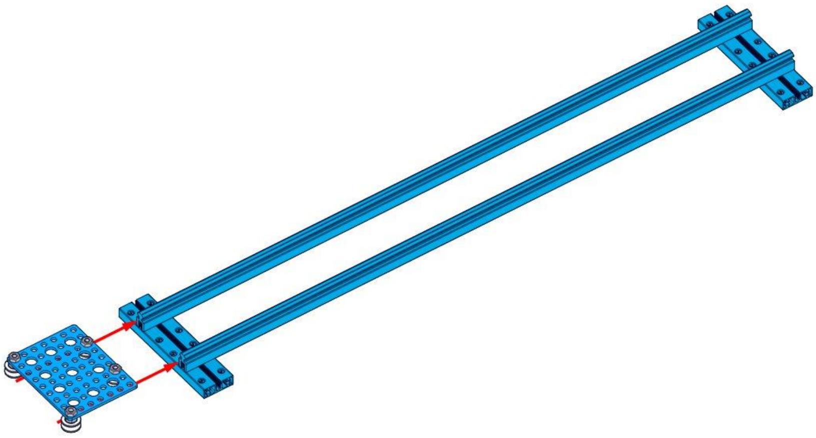


Figure 7



Figure 8

2.3 Install the hitting section

Connect the Bracket, Plate, Beam, DC Frame Type Solenoid and hitting stick by using Countersunk Screw M3, M4, then the strike device is done.

(***Note:*** Make sure the small end of spring inside the DC Frame Type Solenoid HCNE1-0530 should install outward, and the threaded slot of Beam 0808-88 should install upside down.)

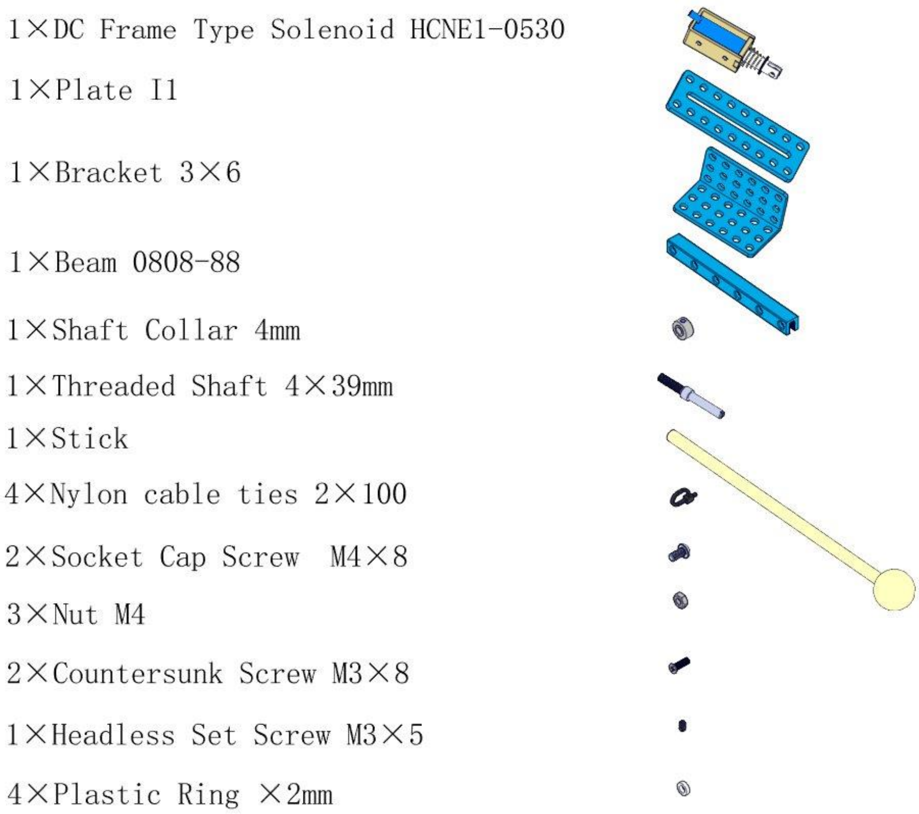


Figure 9

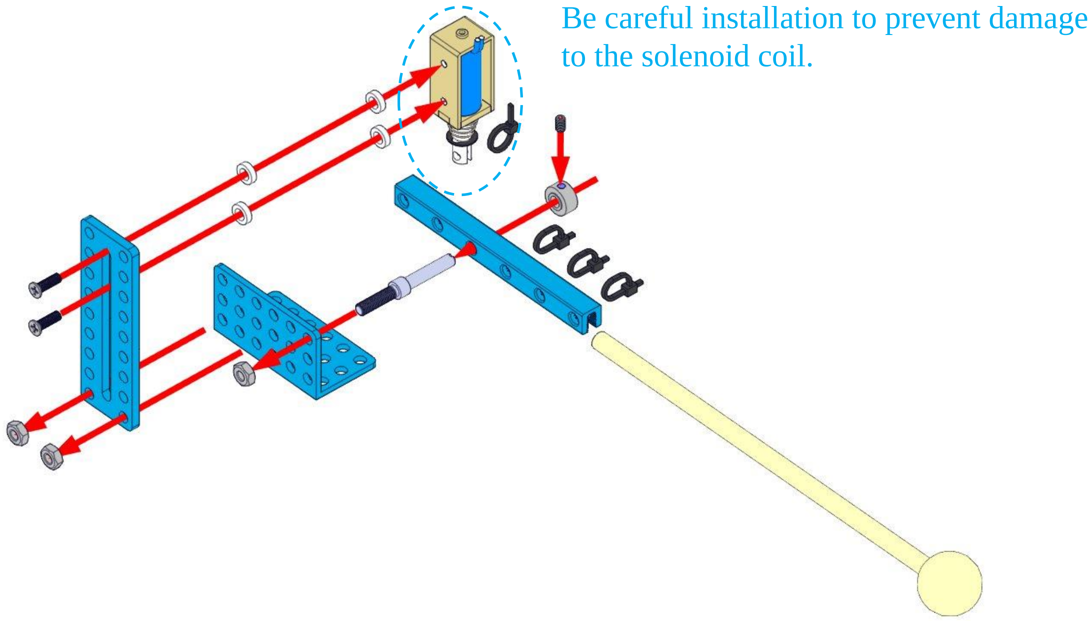


Figure 10

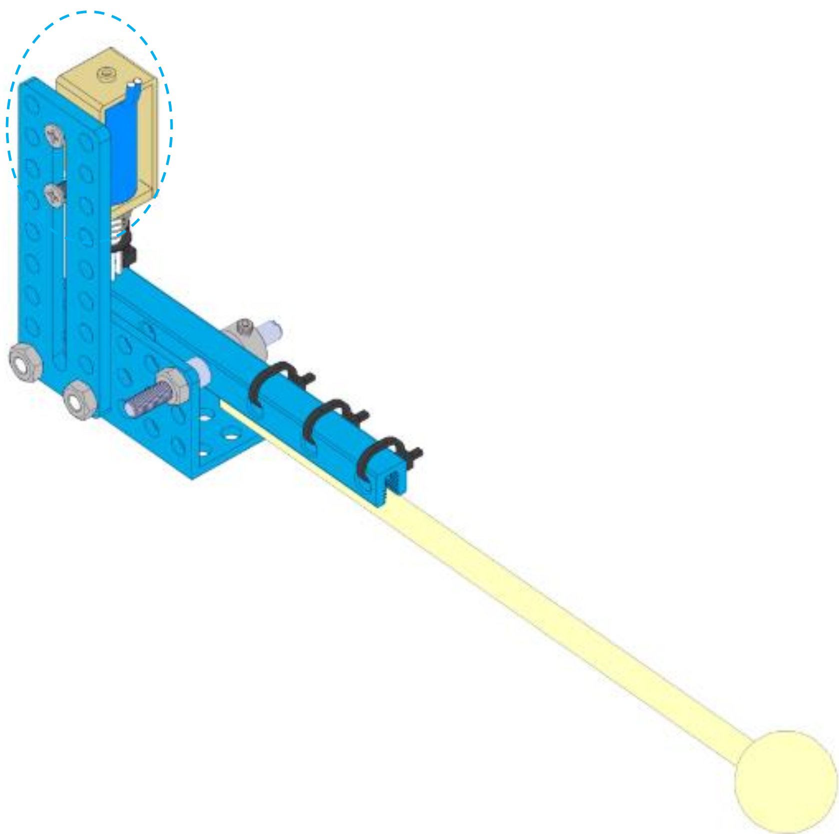


Figure 11

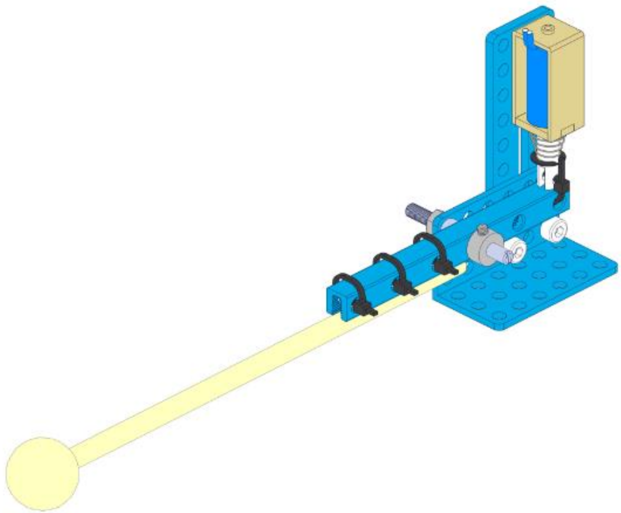
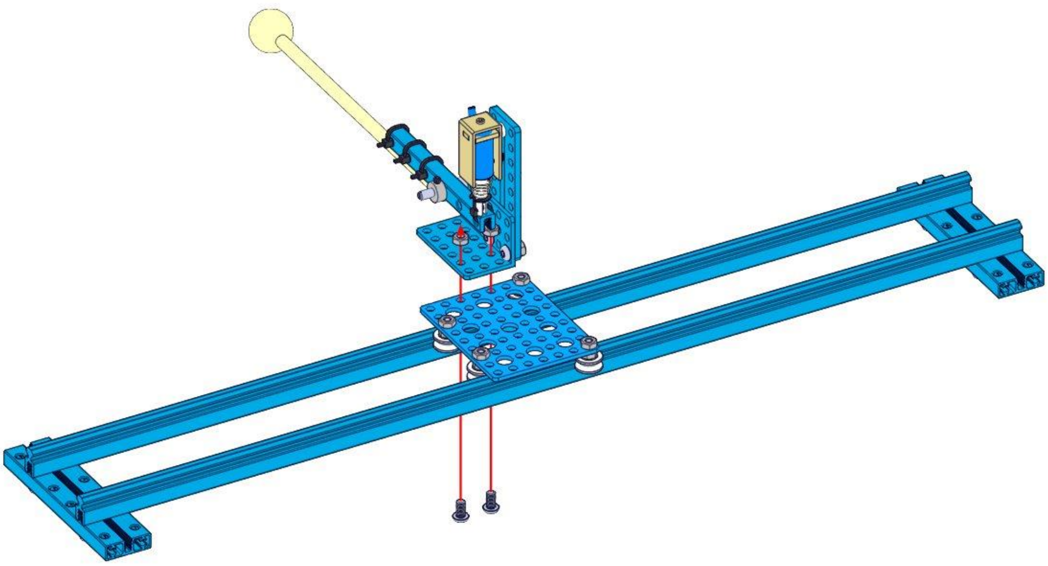


Figure 12

2.4 Connect the slide rail and hitting section together

Connect the strike divide and the base set by 2 X Nut M4.

(***Note:*** Pay attention to the connection of Slide Rail and Hitting Section.)



2×Socket Cap Screw M4×8

2×Nut M4

Figure 13

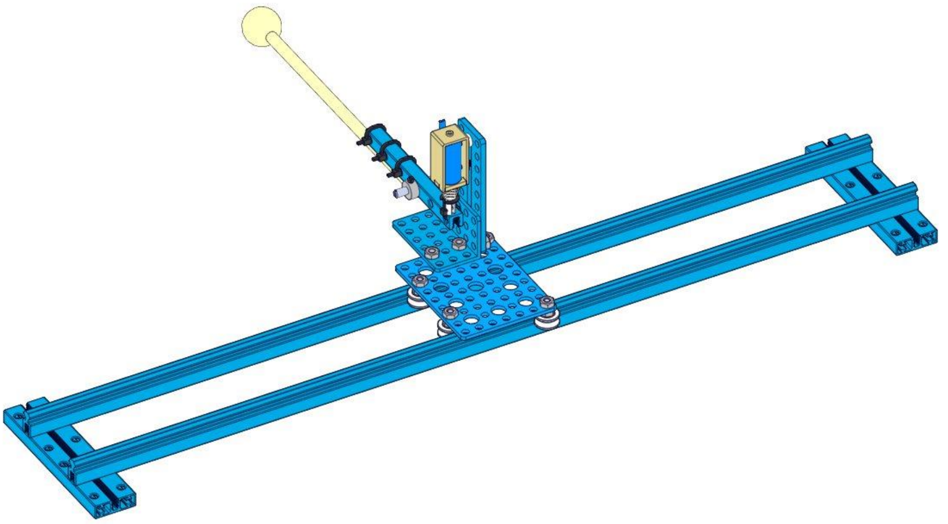


Figure 14

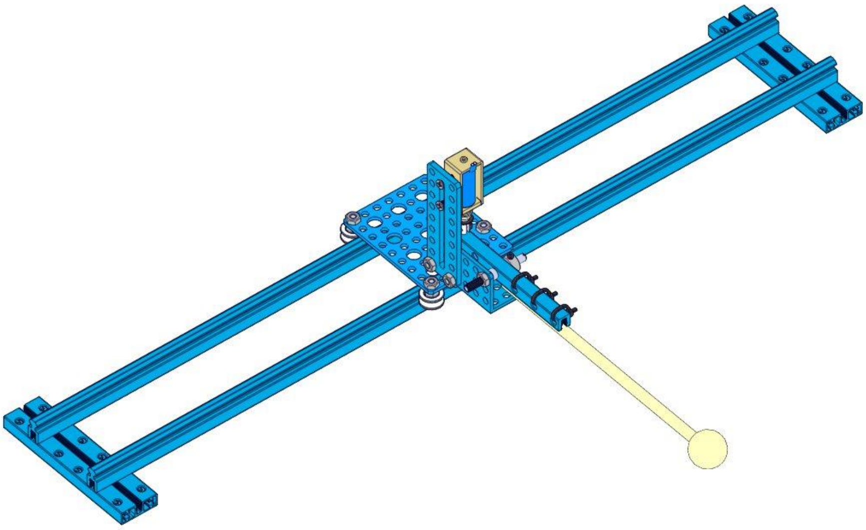


Figure 15

2.5 Install the stepper motor and limit switches

The stepper motors and limit switches mounted on the stepper motor bracket.

(***Note:*** Pay attention on the position and direction of the limit switches.)

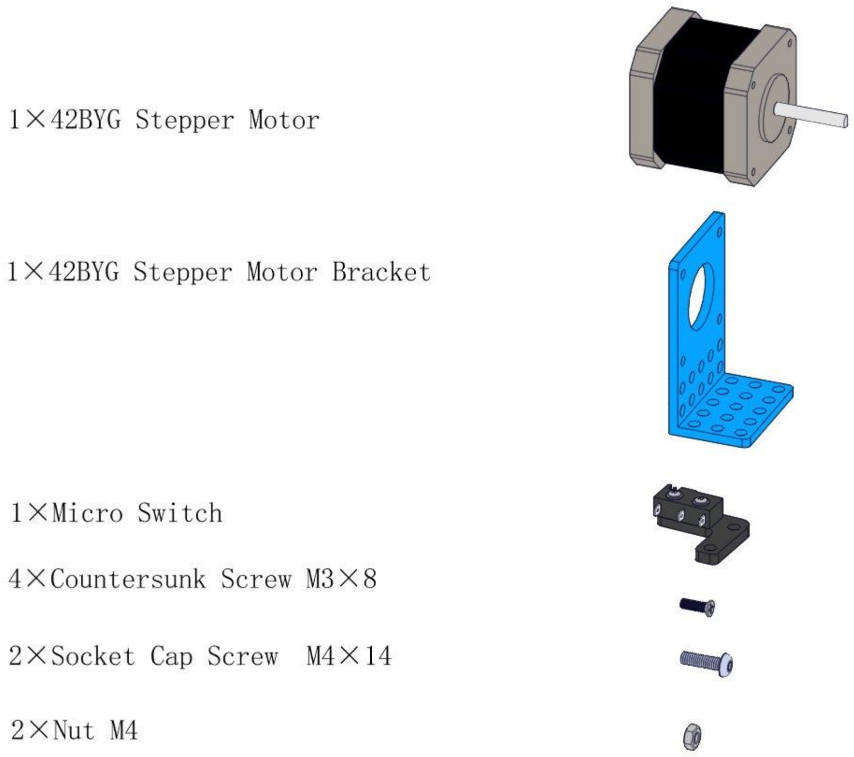


Figure 16

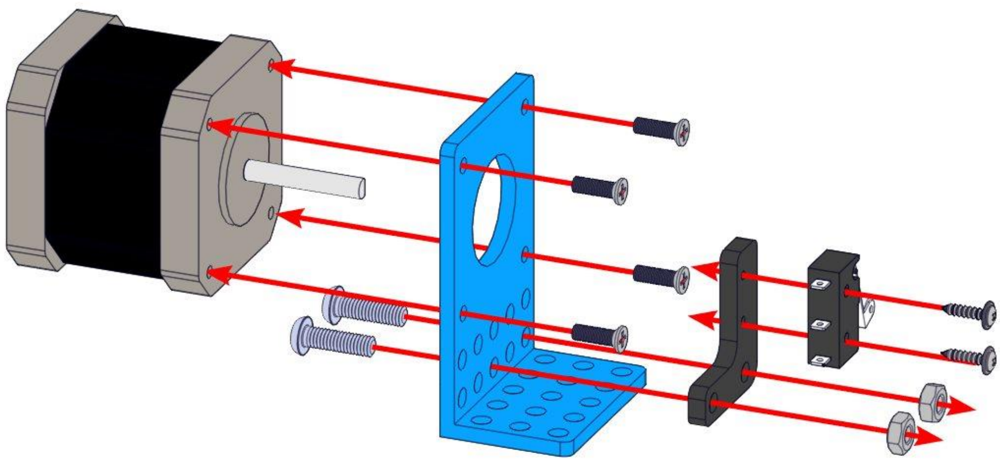
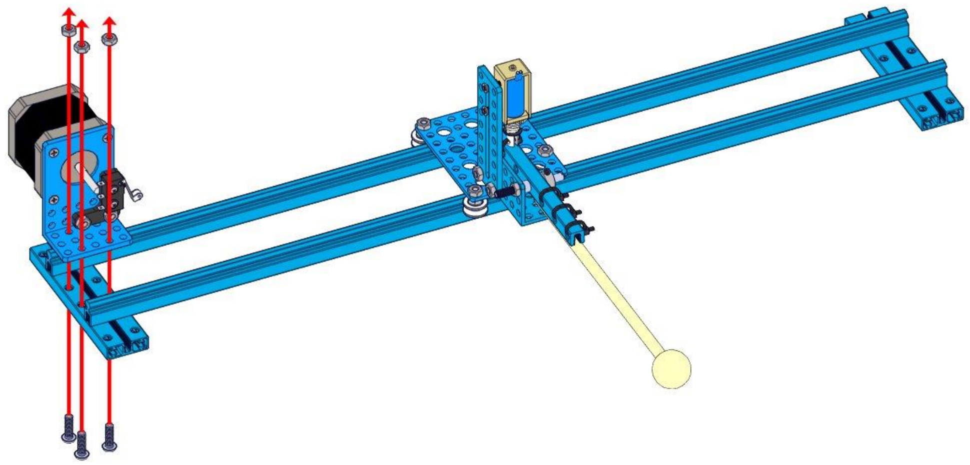


Figure 17



3×Socket Cap Screw M4×14

3×Nut M4

Figure 18

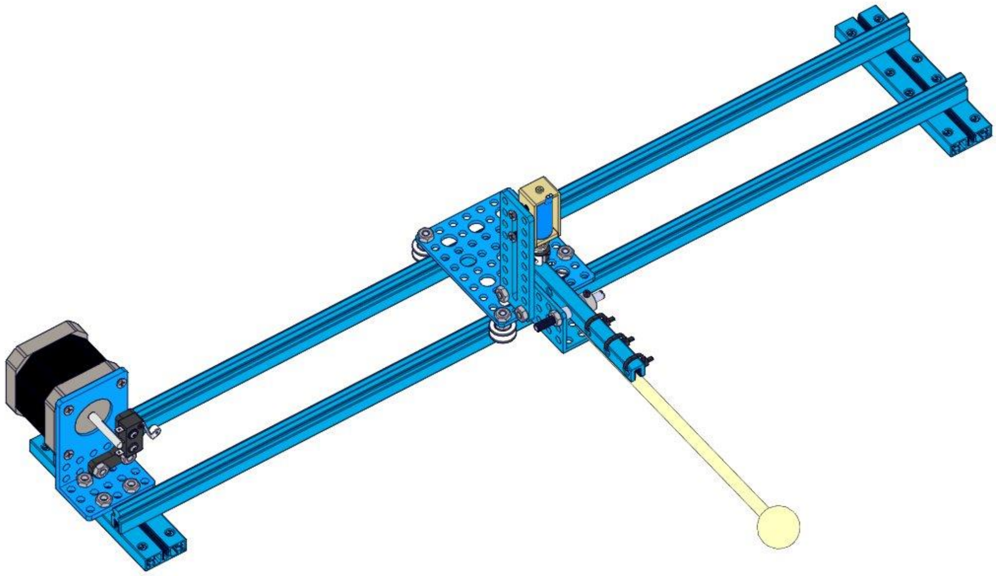


Figure 19

2.6 Install the timing pulley and add into sliding rail section

Prepare 2 x timing pulley wheels and add them onto sliding rail section.

(***Note:*** Please make sure the Timing Pulley 62T install at the same side of stepper motor, the Plastic Rivet R4120 side forward to the stepper motor.)



Figure 20

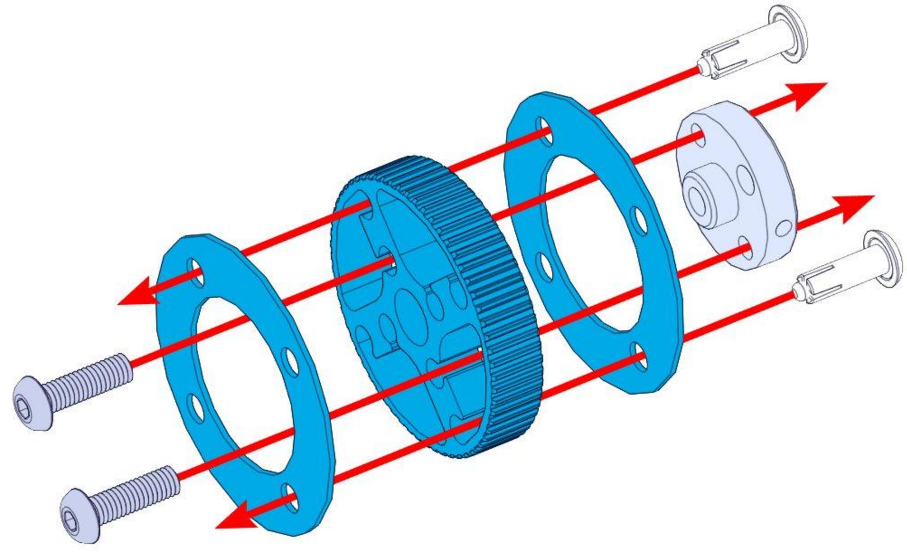


Figure 21

1×Timing Pulley 62T

2×Timing Pulley Slice 62T

1×Beam 0824-48

1×Threaded Shaft 4x39mm

2×Flange Bearing 4×8×3mm

2×Plastic Rivet R4120

1×Shaft Collar 4mm

1×Headless Set Screw M3×5

2×Plastic Ring 4×7×2mm

1×Nut M4



Figure 22

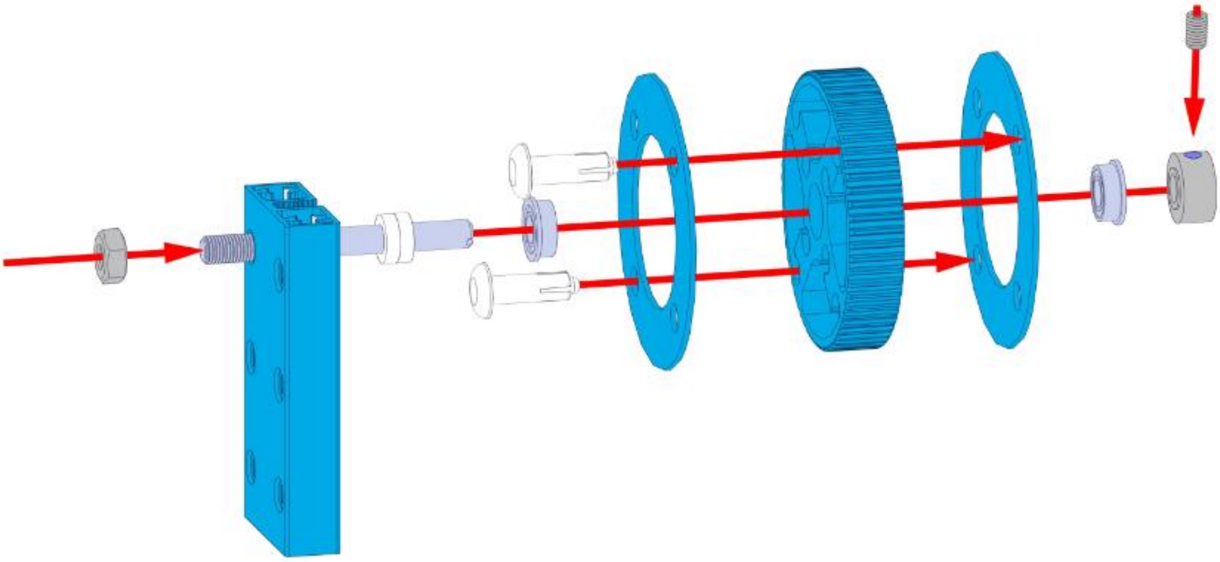
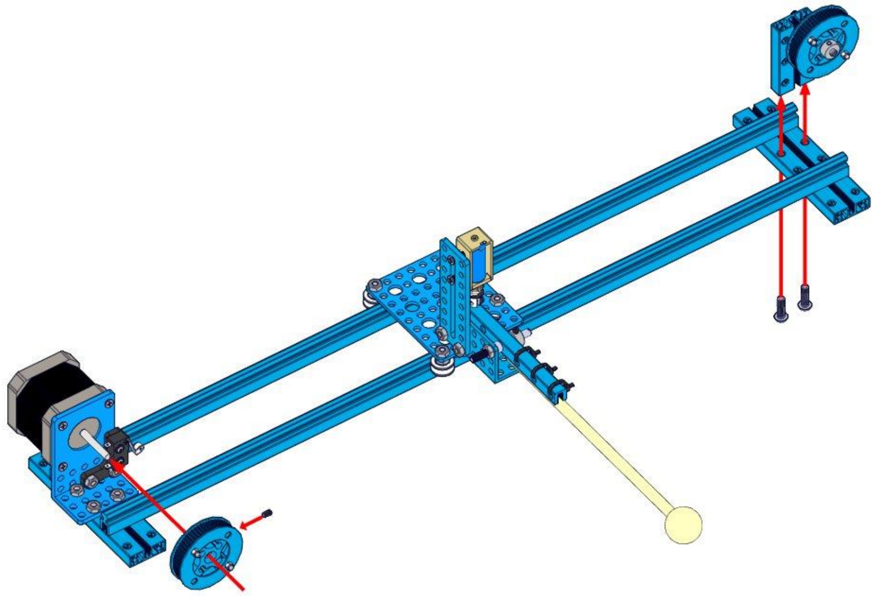


Figure 23



1×Headless Set Screw M3×5

2×Socket Cap Screw M4×14

Figure 24

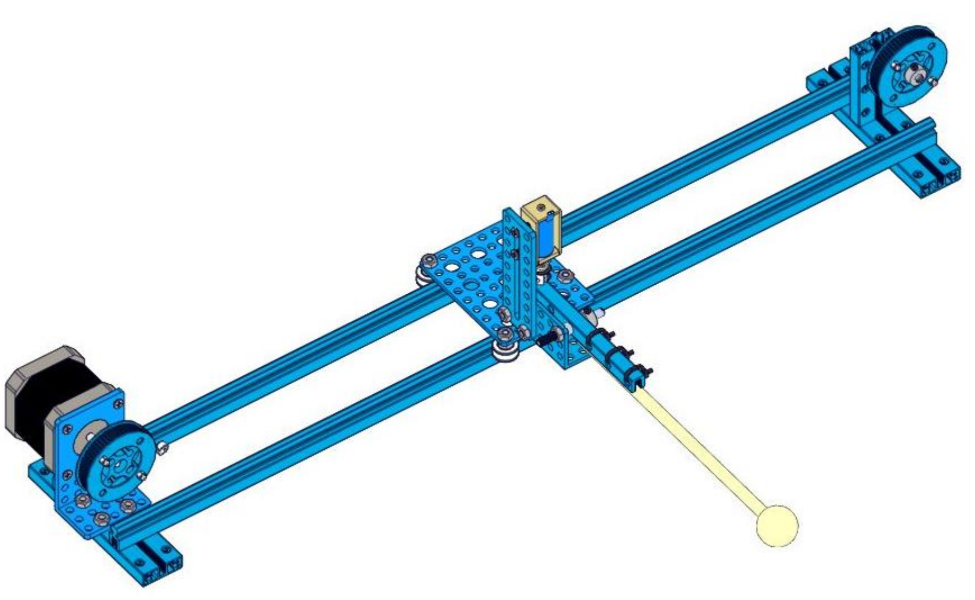


Figure 25

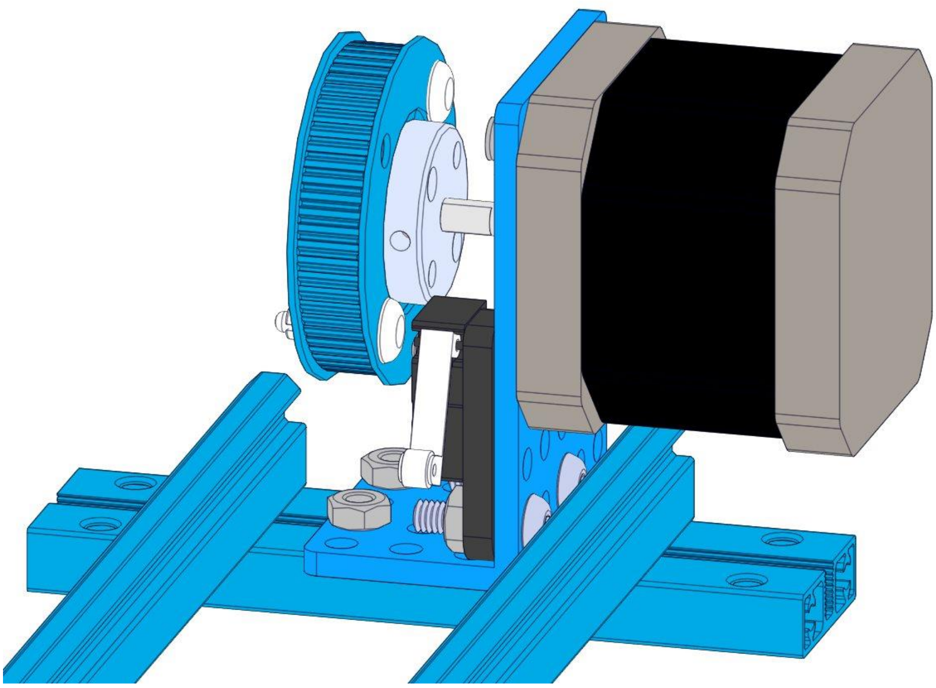


Figure 26

2.7 Install the timing belt

Using the timing belt to connect the 2 x Timing Pulley Wheels.

(***Note:*** Please adjust the timing belt tight enough, it can't be too loose.)

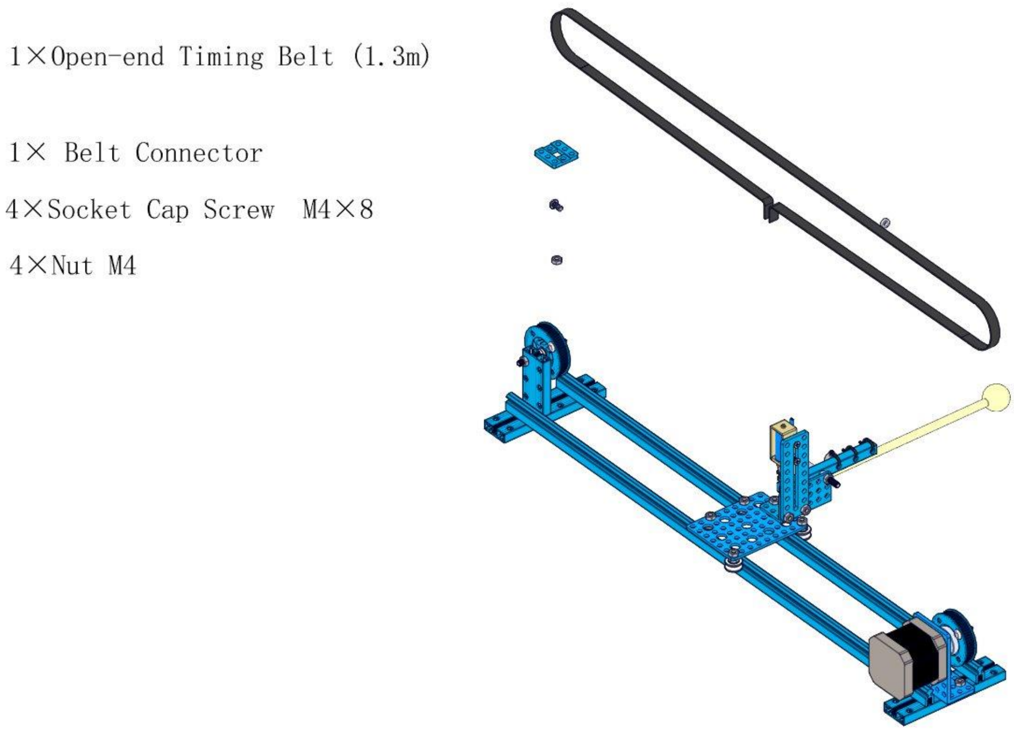


Figure 27

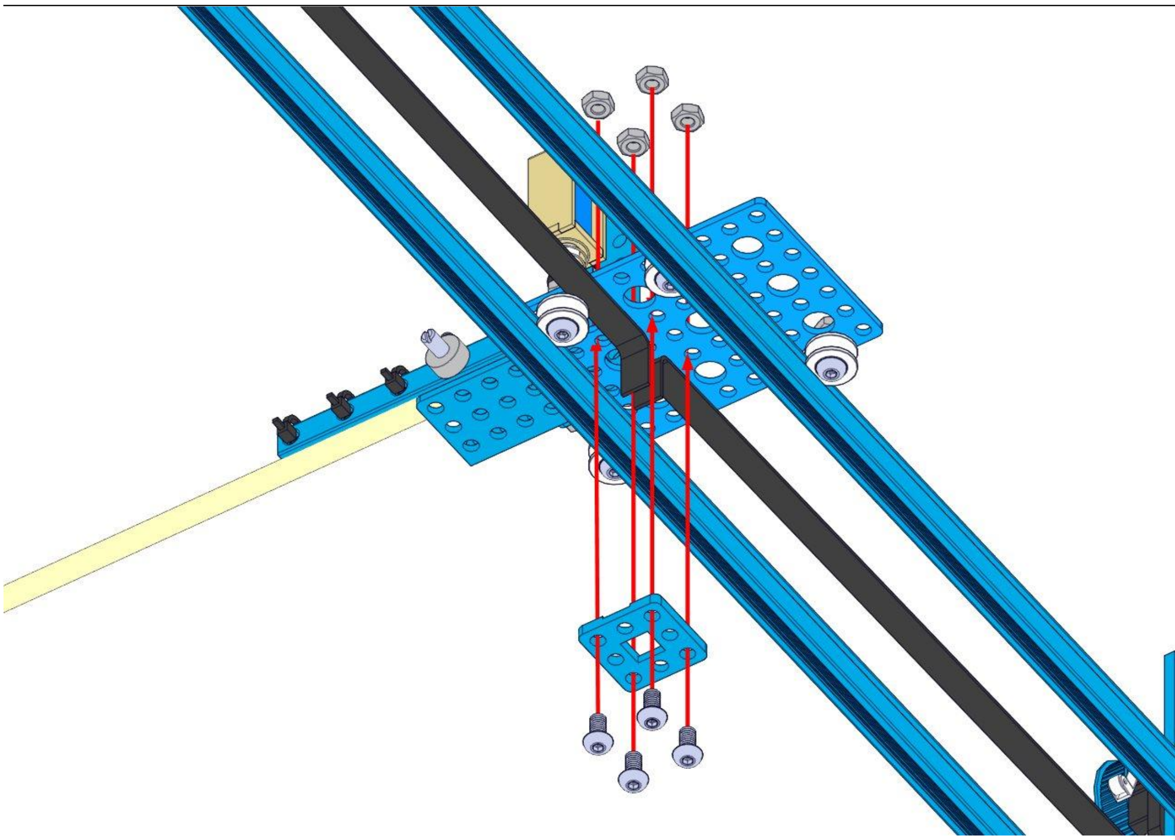


Figure 28

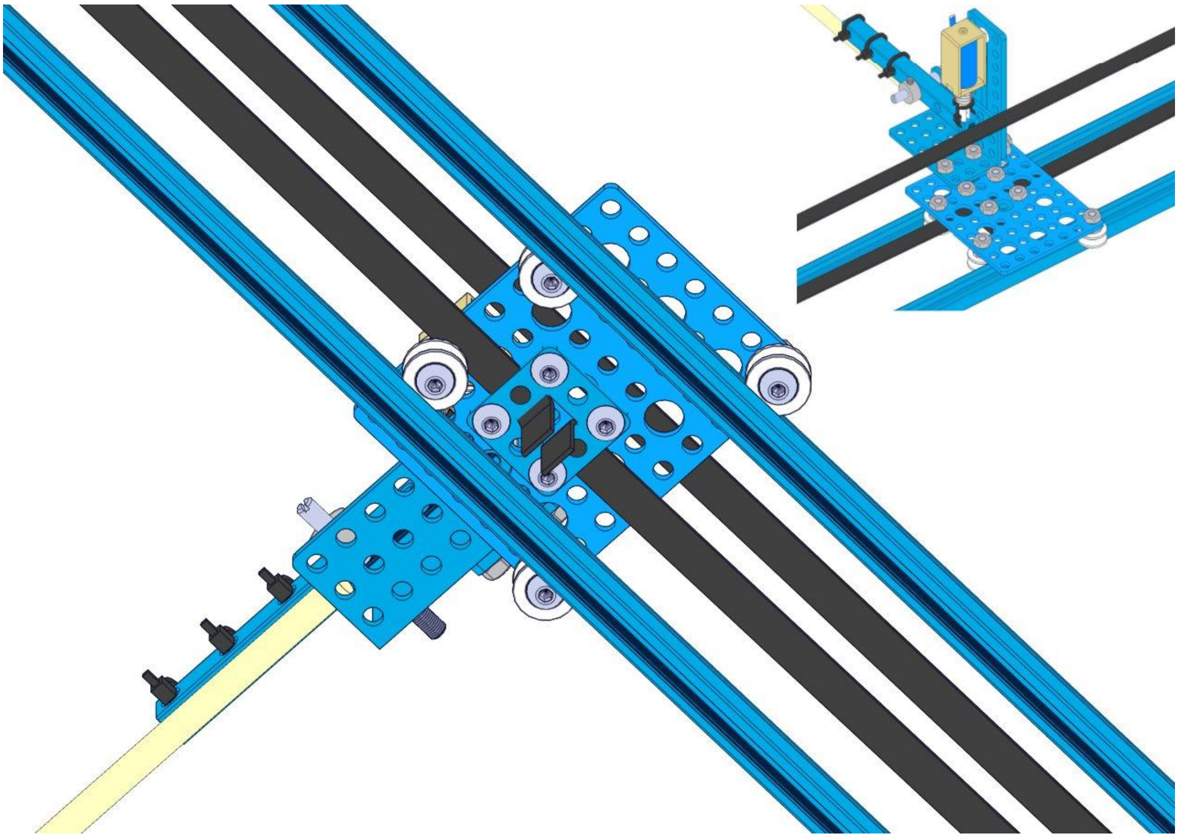


Figure 29

2.8 Install the electronic modules

Please install the electronic modules as the figure shown below.

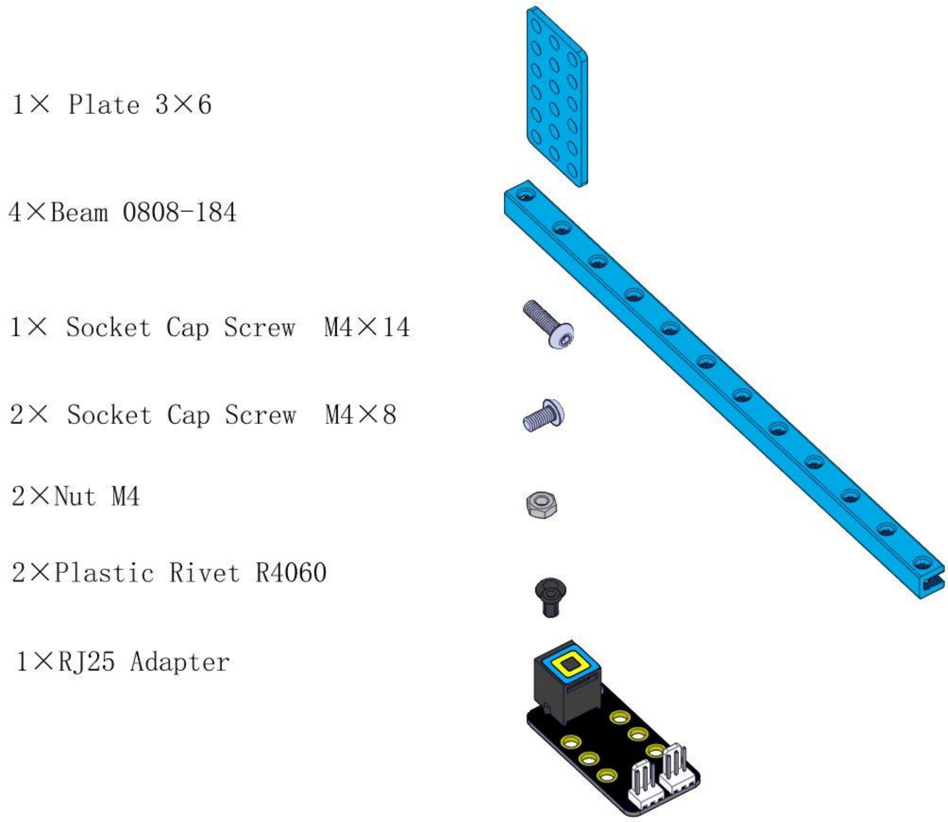


Figure 30

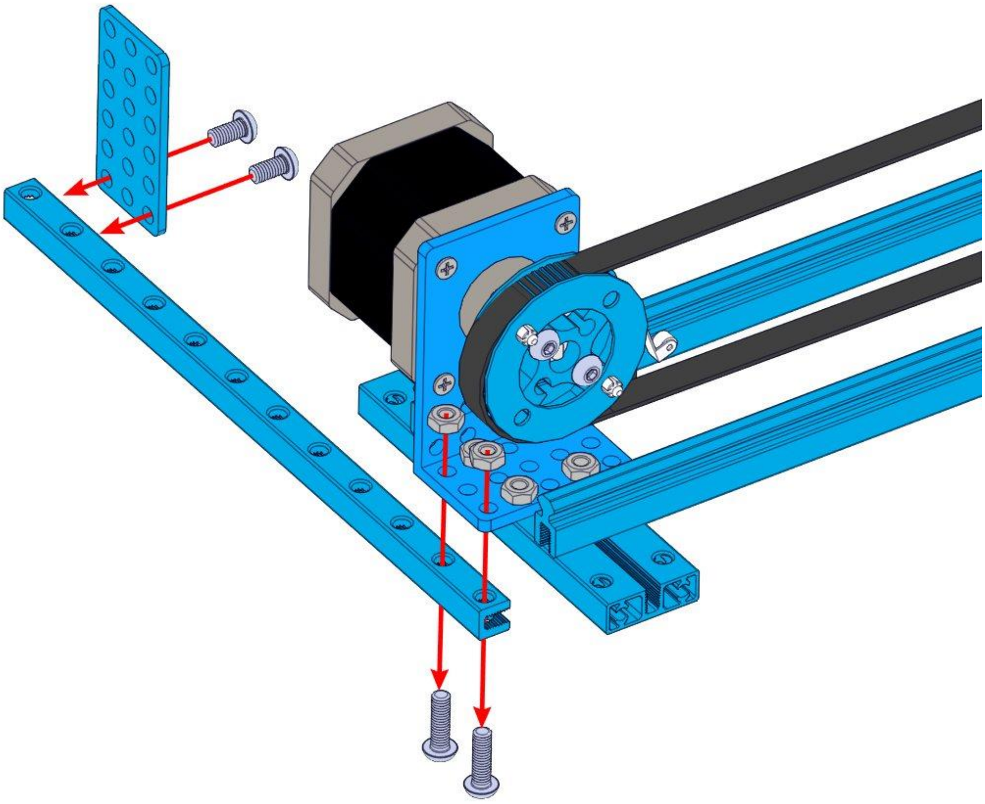


Figure 31

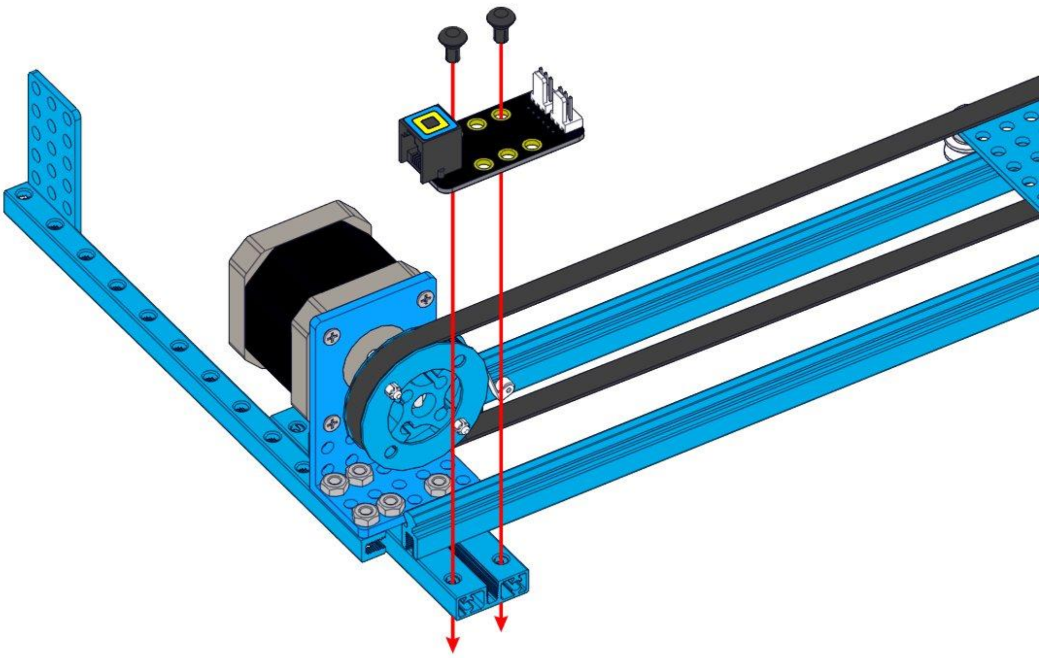


Figure 32

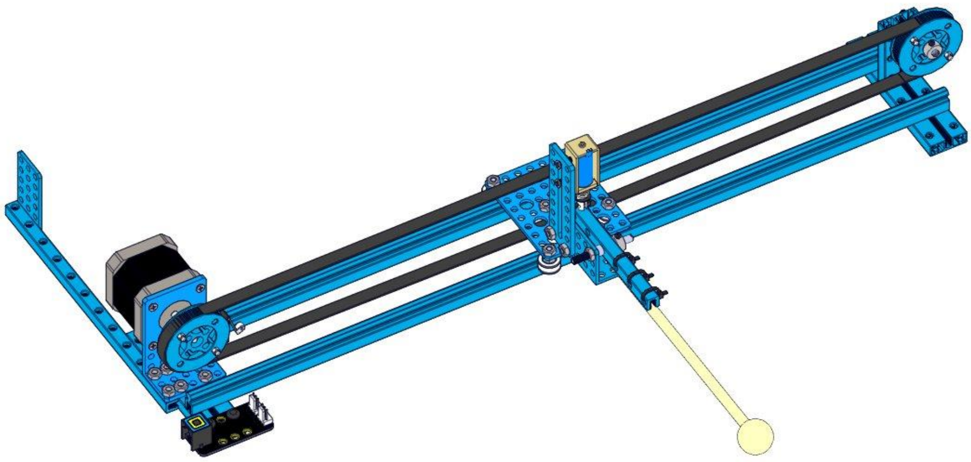


Figure 33

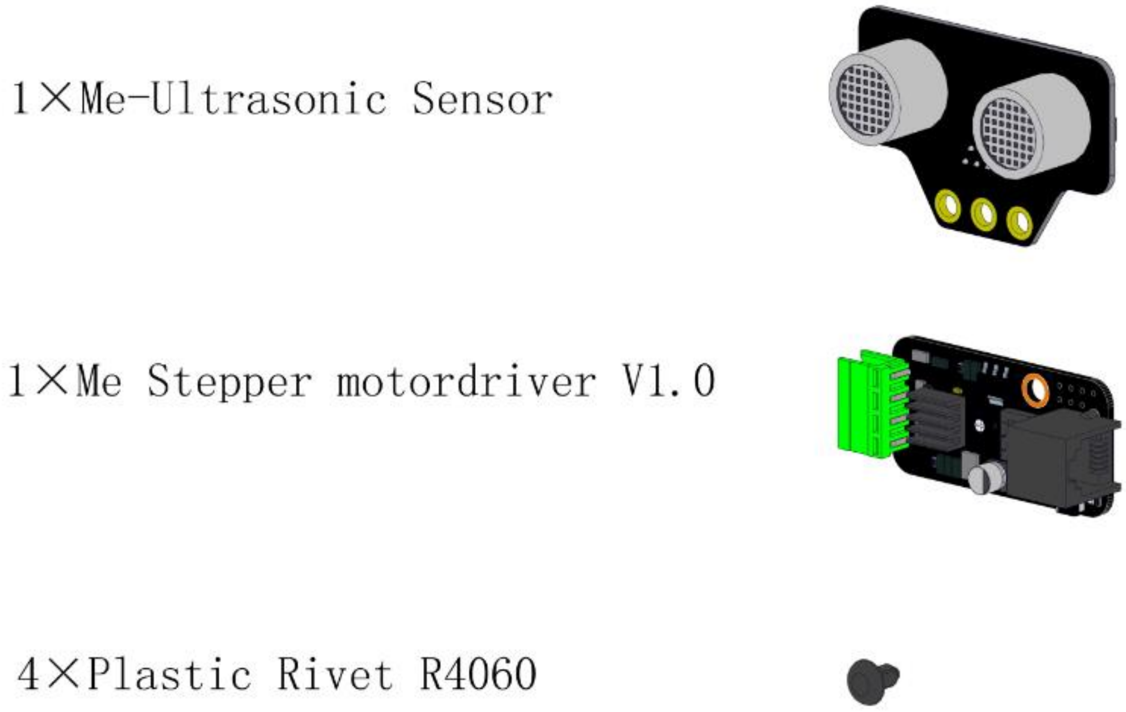


Figure 34

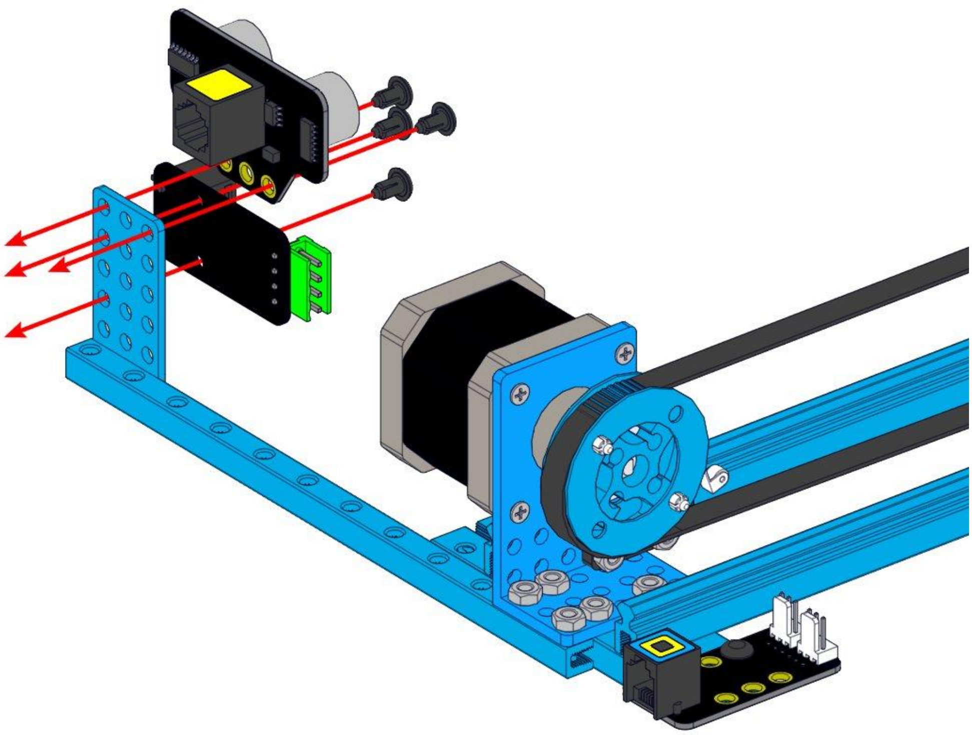
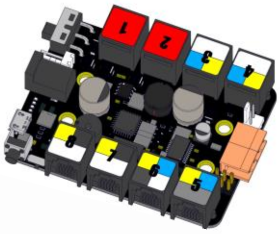
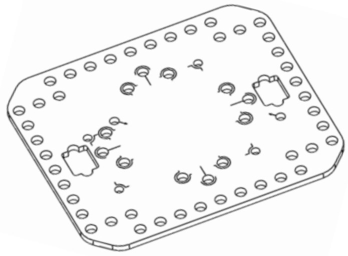


Figure 35

1×Me Orion



1×Base Bracket



2×Nut M4



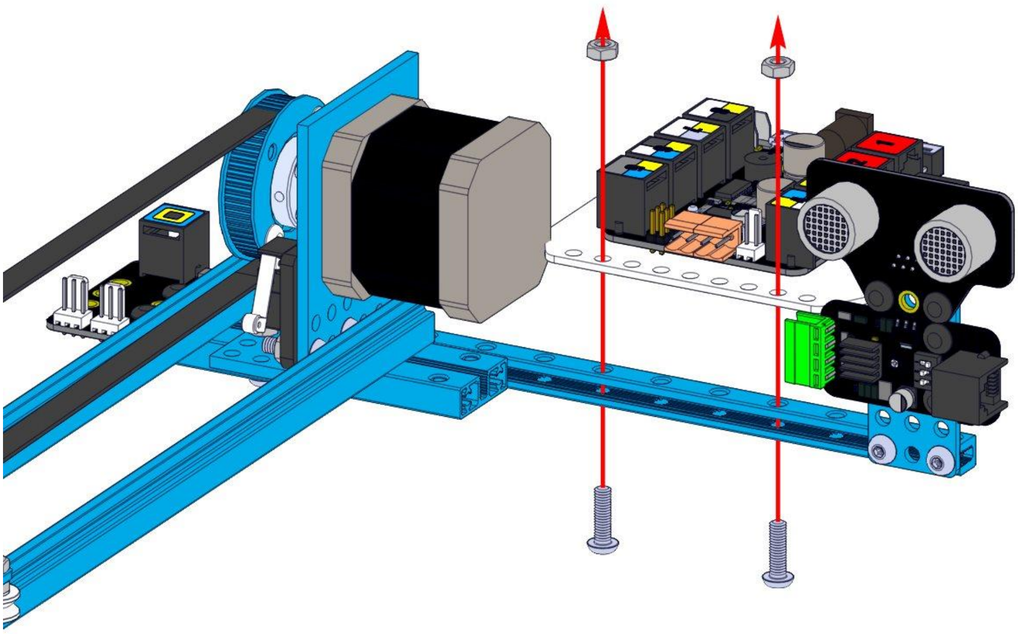
2× Socket Cap Screw M4×14



4×Plastic Rivet R4100



Figure 36



2.9 Music robot kit mechanical part complete

Here's the complete picture of Music Robot Kit.

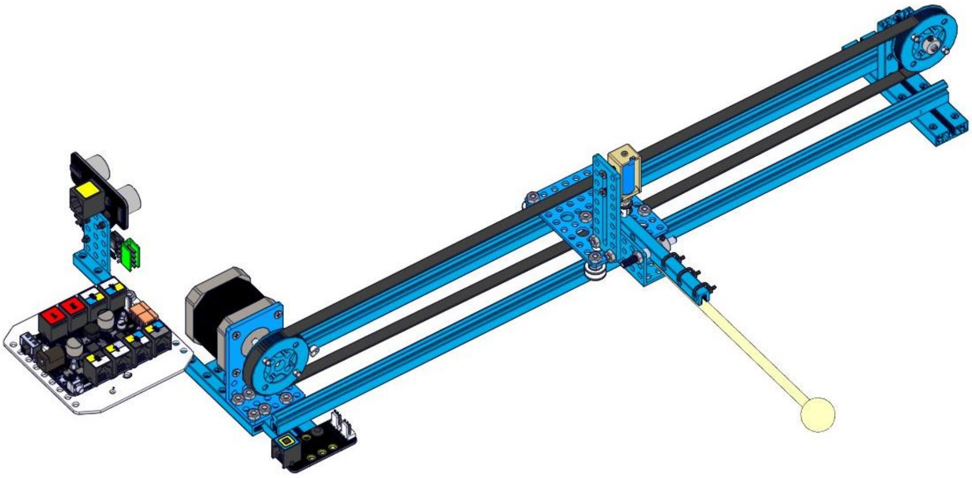


Figure 38

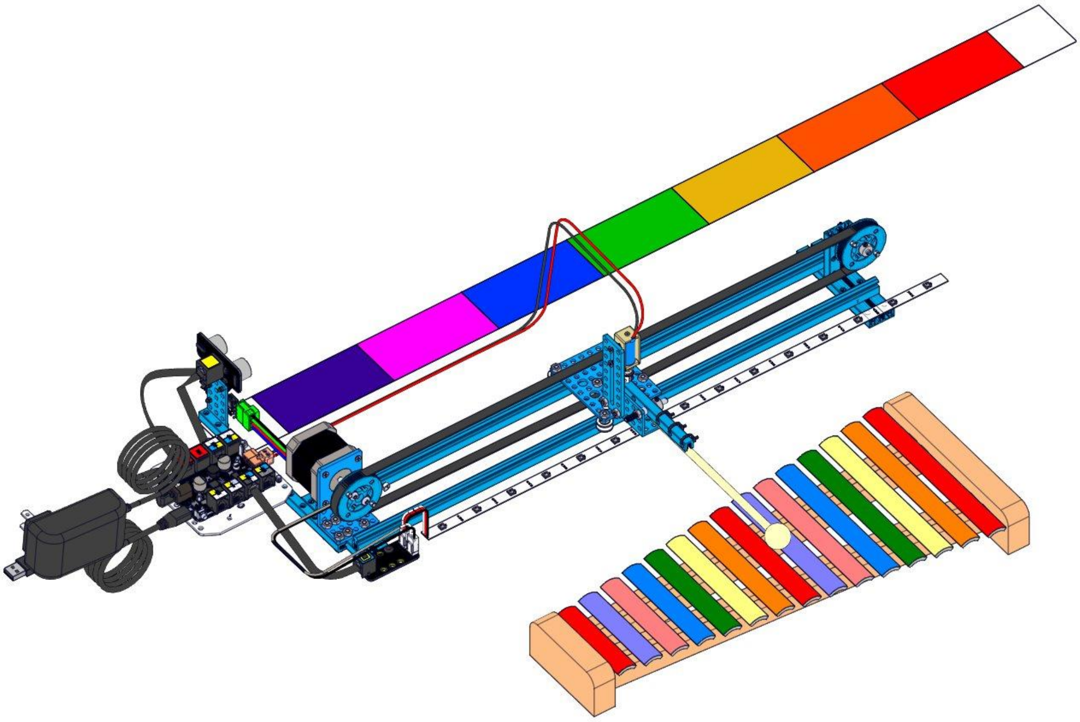


Figure 39

3D model download：https://grabcad.com/library/music-robot-kit-v2-0-1

3 Music Robot Kit V2.0 Electronic Wiring Guide

3.1 Connect the Me Ultrasonic Sensor V2.0 to Port 3 of Me Orion.

3.2 Connect the Me Stepper Motor Driver to Port 1 of Me Orion.

3.3 Connect the DC Frame Type Solenoid to Port M1.

3.4 Connect the Me RJ25 Adapter V2.1 to Port 6.

Pay attention: Me RJ25 Adapter SLOT 1 can connect the LED RGB Strip and SLOT 2 can connect the Me Limit Switch Sensor V2.0.

(***Note:*** Make sure the LED RGB Strip can only connect SLOT 1 and Me Limit Switch Sensor V2.0 can only connect SLOT 2.)

Please check below Music Robot Kit V2.0 Electronic Modules Wiring Diagram

a).Me Limit Switch Sensor V2.0 Wiring Diagram

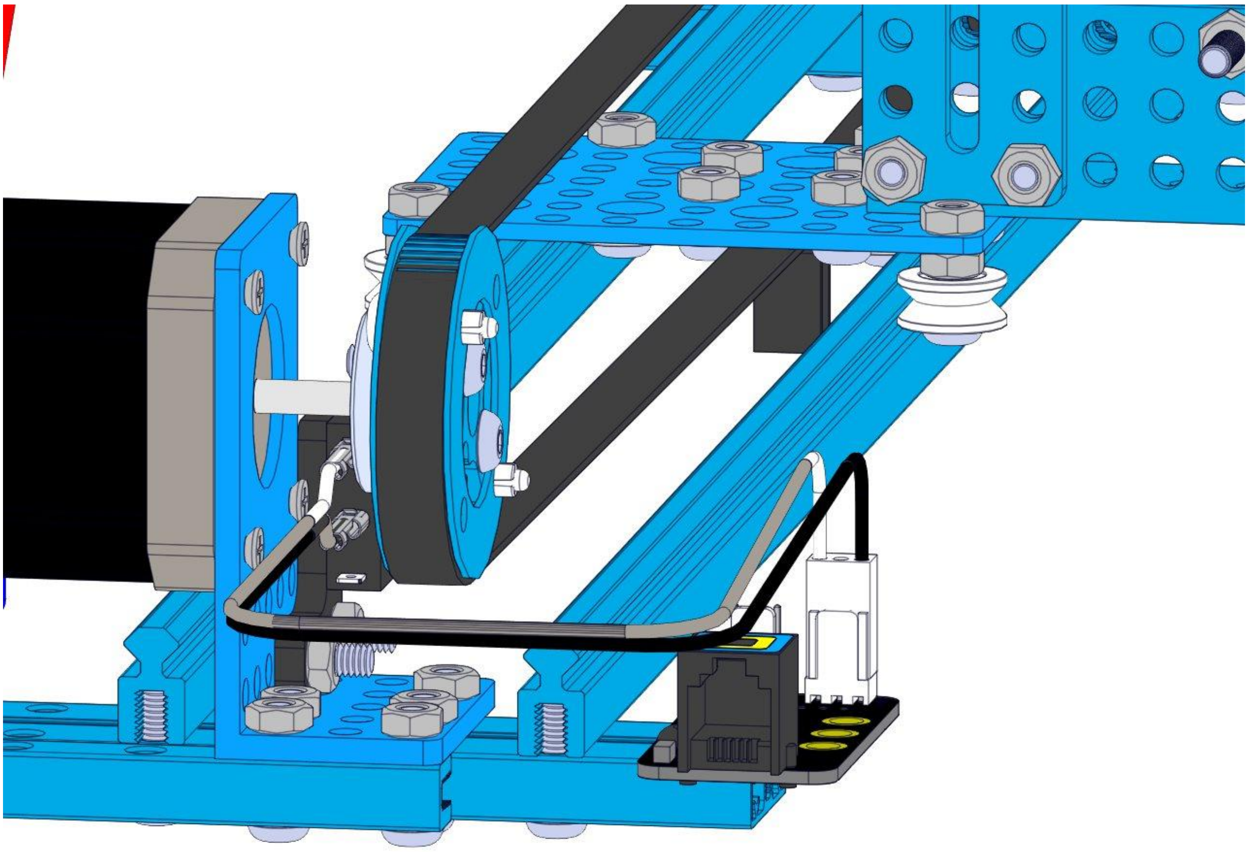


Figure 40

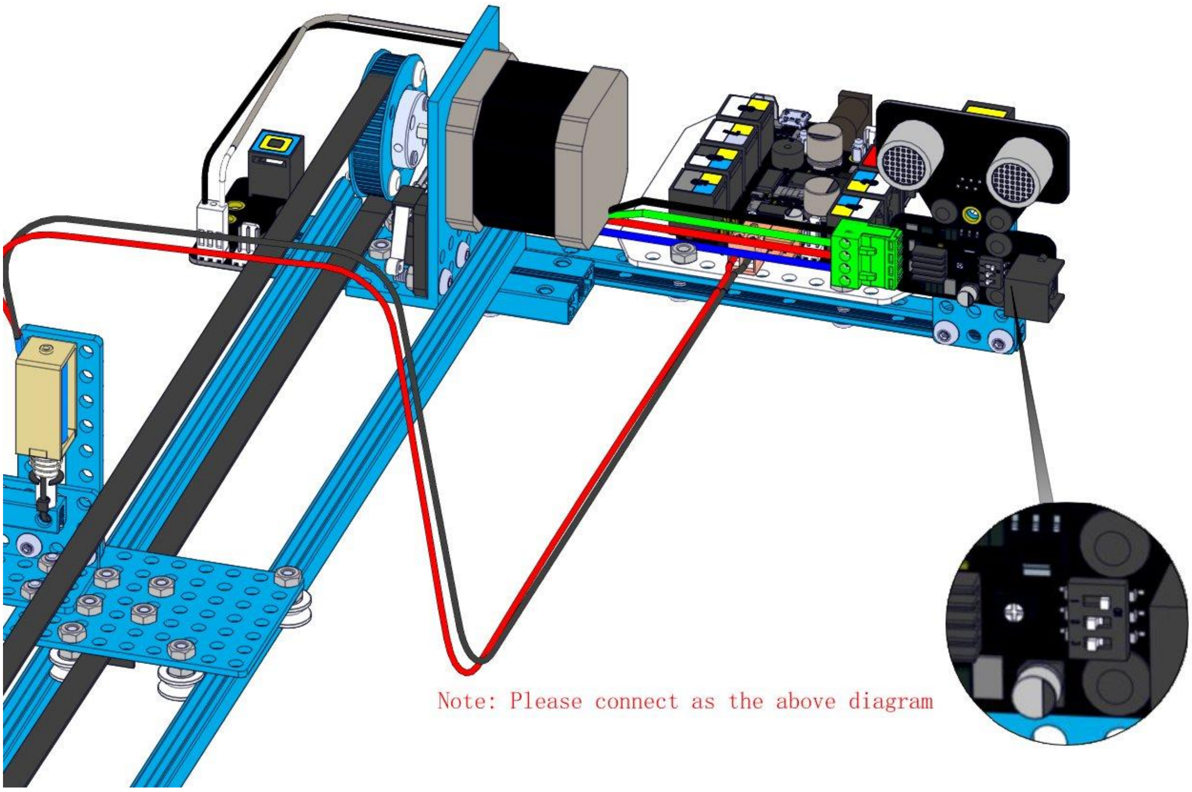


Figure 41

Stepper motor wiring, Miscrostep adjustable and adding fin as below shown:

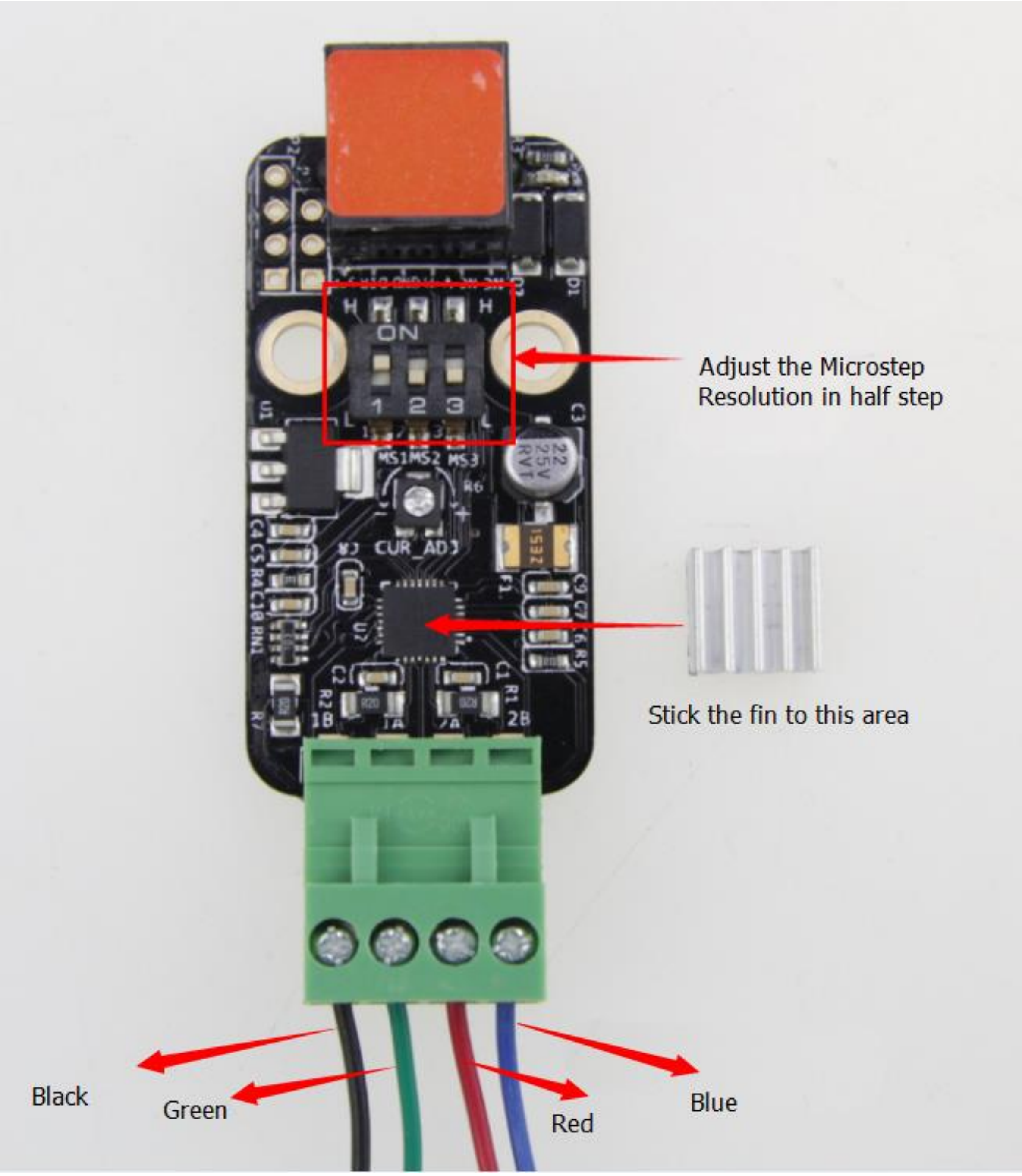


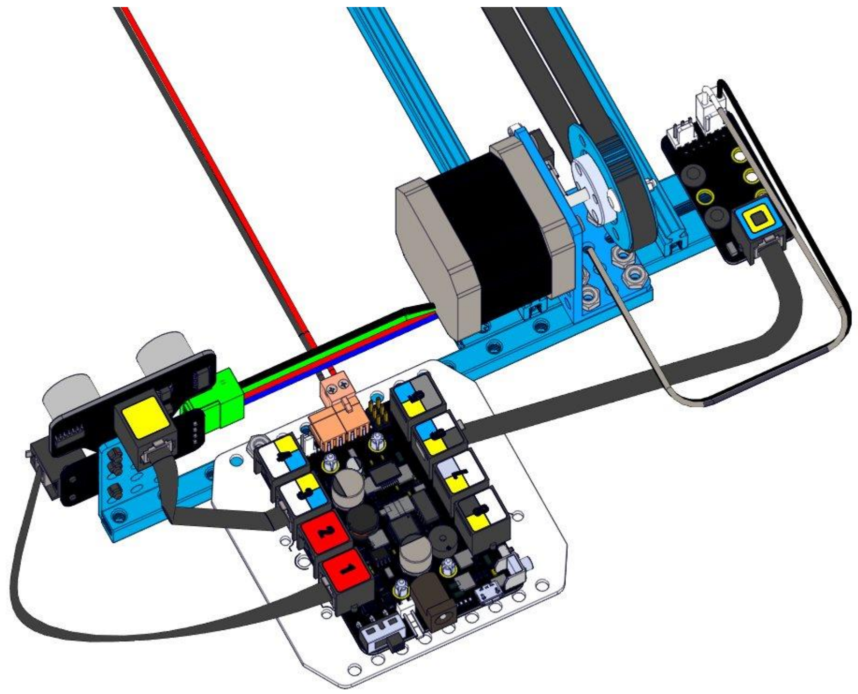
Figure 45

(***Note:*** The smaller excitation mode is, the slower motor is spinning, the higher precision you get.)

Table 1

MS1	MS2	MS3	Microstep Resolution	Excitation Mode
L	L	L	Full Step	2 Phase
H	L	L	Half Step	1-2 Phase
L	H	L	Quarter Step	W1-2 Phase
H	H	L	Eight Step	2W1-2 Phase
H	H	H	Sixteenth Step	4W1-2 Phase

b).Me Ultrasonic Sensor V2.0 Wiring Diagram



Note: Please connect as the above diagram

Figure 42

C).Me Stepper Motor Driver Wiring Diagram

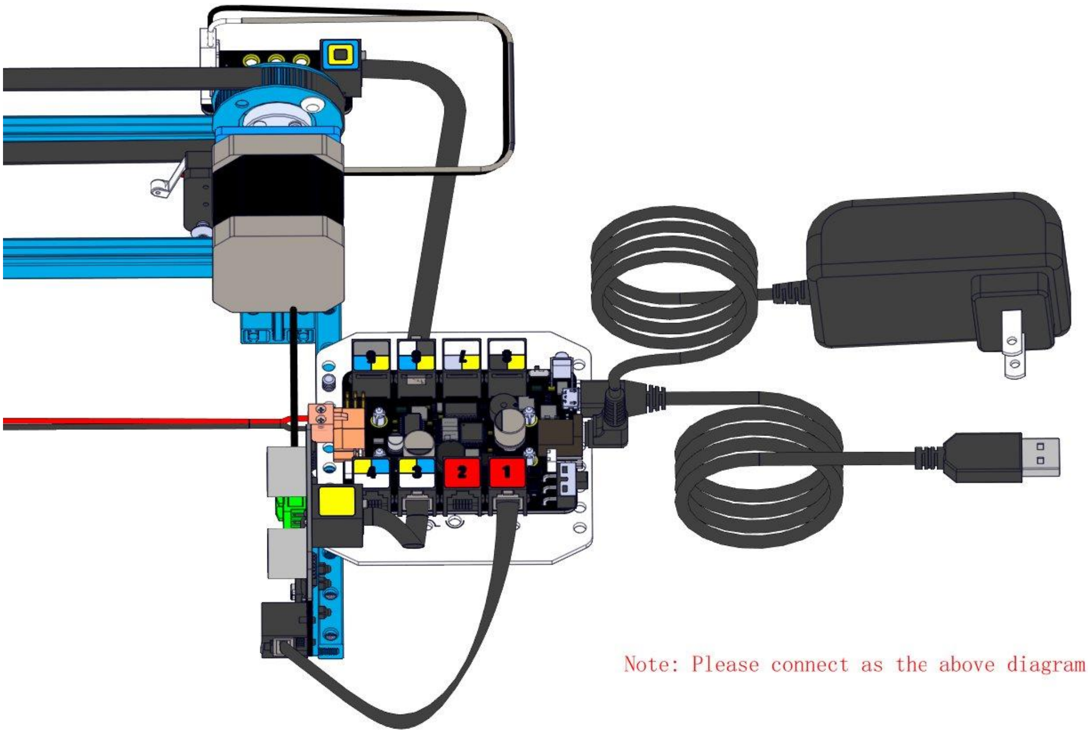


Figure 43

d).LED RGB Strip Wiring Diagram

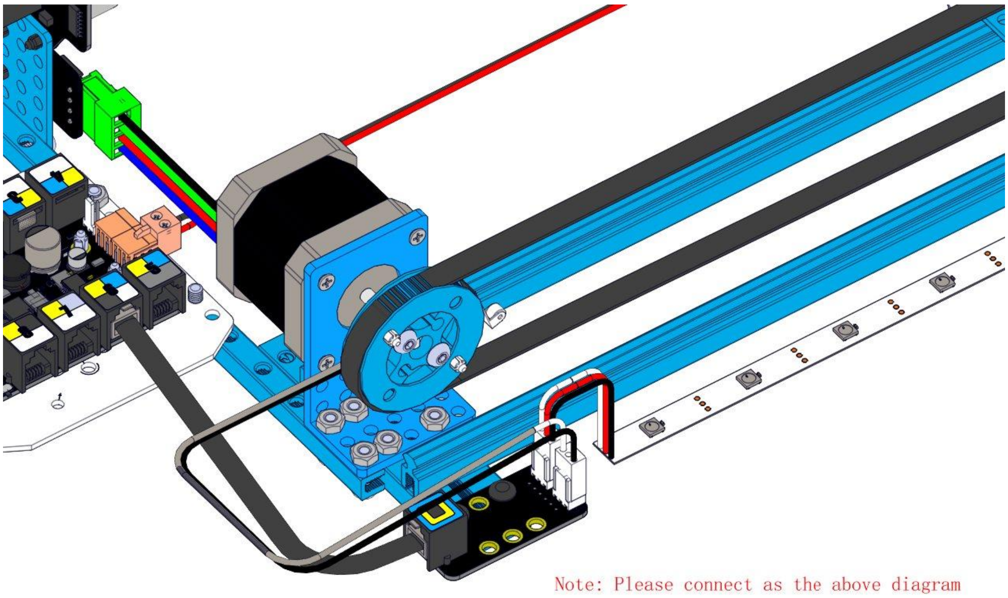


Figure 44

e). Whole Frame Diagram of Music Robot Kit V2.0

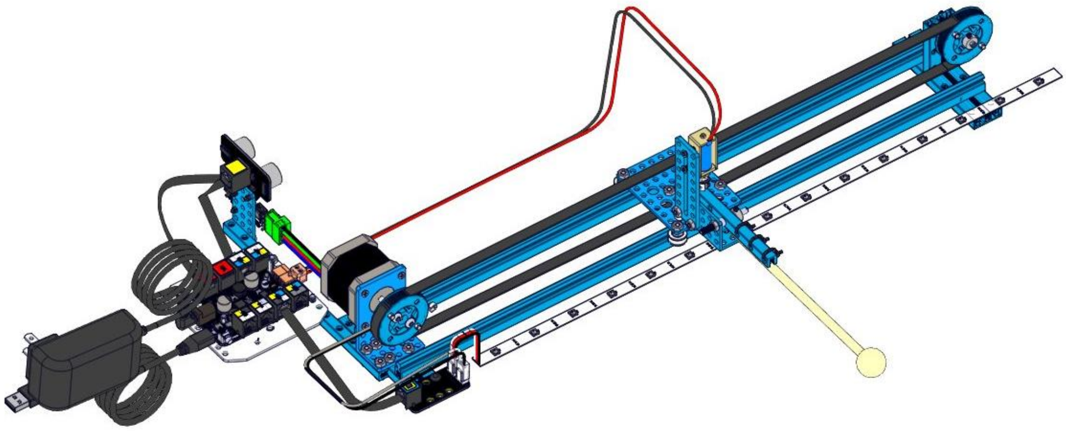


Figure 45

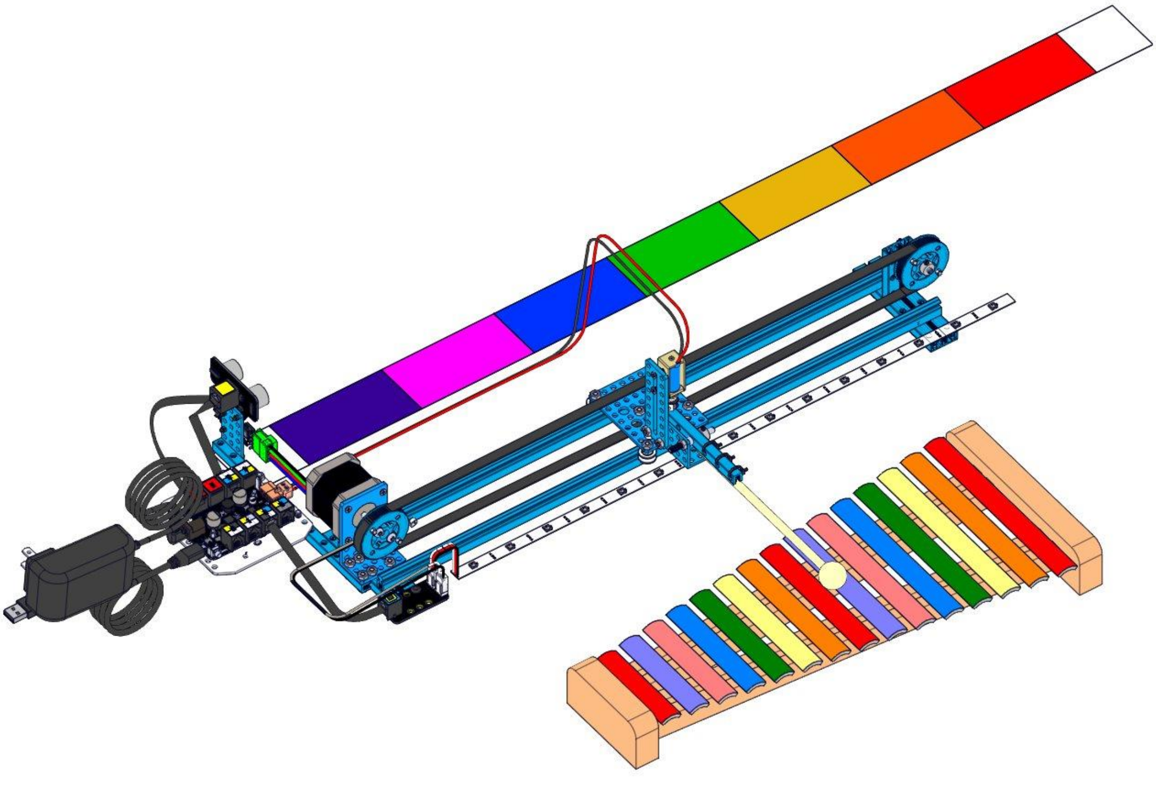


Figure 46

4 Music Robot Kit V2.0 Software Programming Guide

1.When we installed the Music Robot Kit V2.0 and LED RGB Strip-Addressable, Sealed (0.5M) as below shown. Make sure the smaller side of Xylophone towards to stepper motor as shown below.

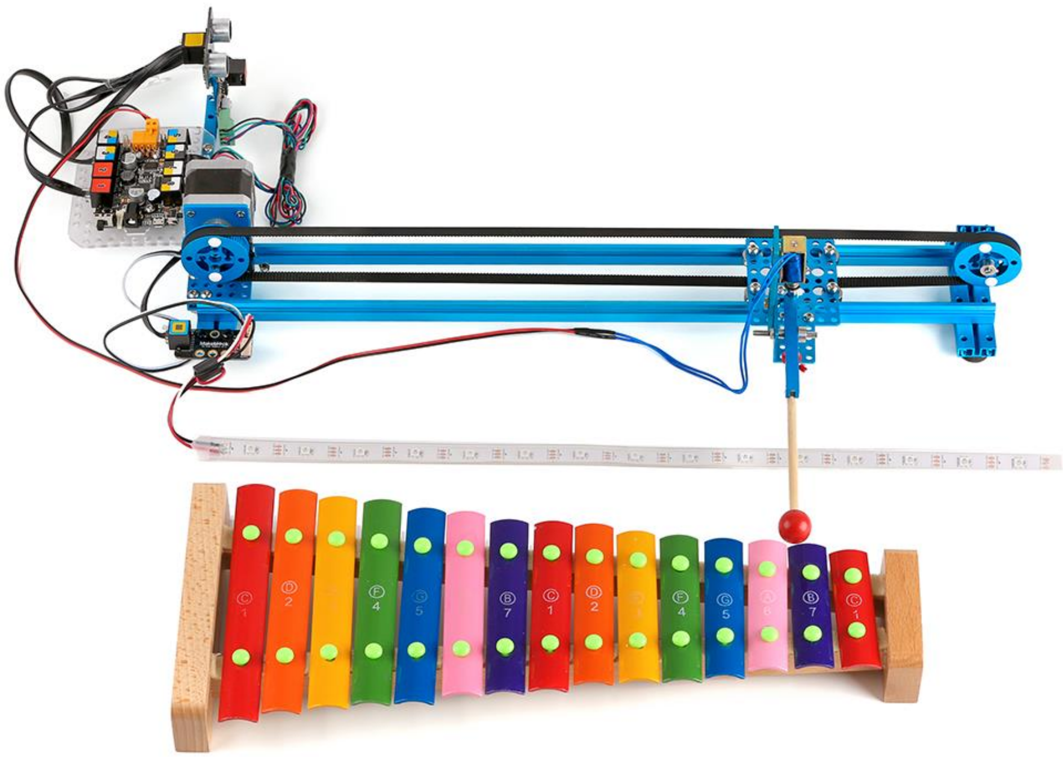


Figure 51

Connect the Me Orion with PC via USB cable, start the up-computer software MusicBot , click the Serial pull-down menu and choose correct port (expect COM1), as shown below.



Figure 52

2.Choose the type of your Arduino board, you can figure out by checking the back of your Arduino board. Here we use Arduino Uno as example.



Figure 53

3.Click the “Connect” , and click “Upgrade”, the firmware will update. (A stable network is required.)



Figure 54

4. After updating, Music Robot Kit V2.0 will keep moving until reach the Me Limit Switch Sensor V2.0. When it touch the limit switch, it will move back a short distance and hit the first note. At the same time, the first LED RGB Strip will turn on. Stay for 3 seconds, Music Robot will play “Brother John” and it will stop play when the music is finished. You can control the Music Robot by 2 ways: Using gestures or up-computer.

4.1 Using gestures

When your hand in front of some note to move, the Music Robot will hit the note key correspondingly. Make sure your hand is in range of Ultrasonic Sensor gap-measurement. You can also use MusicBot to turn on/off the Ultrasonic function.

4.2 Using up-computer

4.2.1 By mouse click

When you click the of Musicbot software to some note, the Music Robot will hit the corresponding note key as below shown.

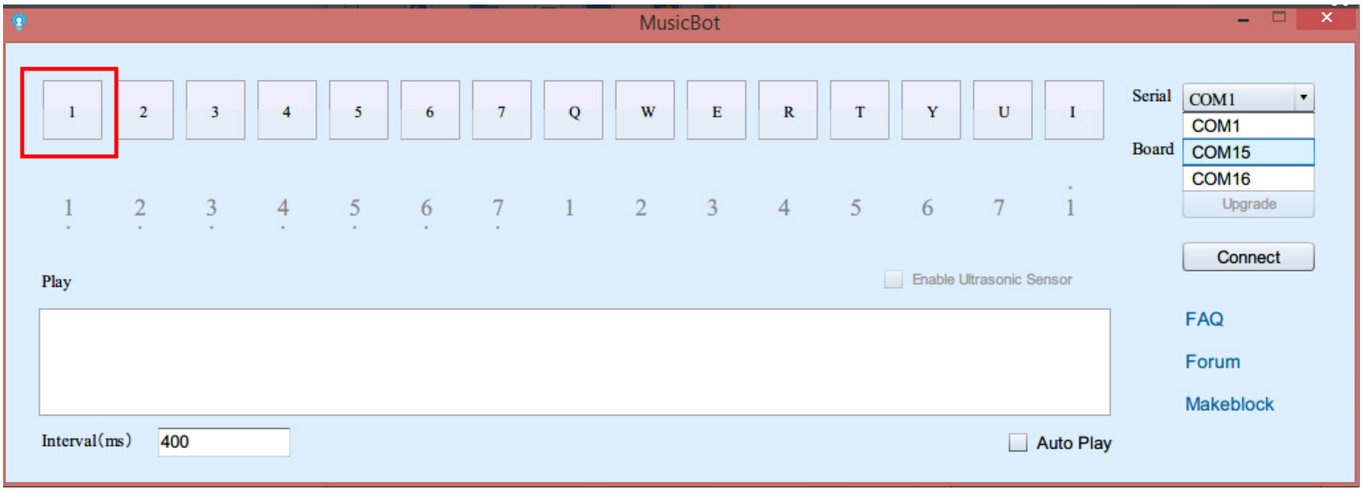


Figure 55

4.2.2 By keyboard operation

You can play the Music Robot by type the corresponding note key via keyboard

4.2.3 Key in the formula in the Play area (A space corresponds to a pause), and click the Auto Play box, the Music Robot will hit the Xylophone automatically. You can DIY your own music, have fun with DIY.

Note: Interval (Unit: millisecond) data is the pause time during each note, please make sure it's no less than 300.

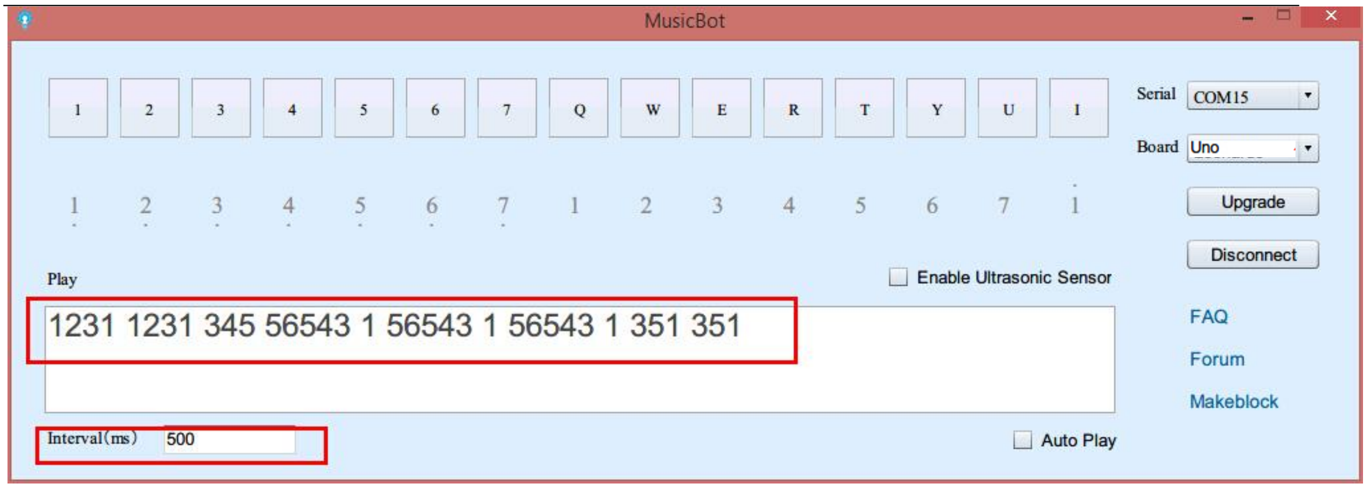

MusicBot
1
2
3
4
5
6
7
Q
W
E
R
T
Y
U
I
Serial
COM15
Board
Uno
Upgrade
Disconnect
Play
Enable Ultrasonic Sensor
1231 1231 345 56543 1 56543 1 56543 1 351 351
FAQ
Forum
Makeblock
Interval(ms)
500
Auto Play

Figure 56

5 FAQs (Frequently Asked Questions of Music Robot Kit)

Q1: Why I connect the power, the Music Robot will out of control and slide back and forth.

Answer: Because once you turn on the Music Robot, it will hit the Xylophone by us

Music Robot will play “Brother John” and it will stop play when the music is finished. You can control by using gestures and up-computer.

Q2: Why the Music Robot Kit slide back and forth, there’s no response of DC Frame Type Solenoid, it can’t play the music?

Answer:

1. Check if the DC Frame Type Solenoid spring is installed correctly (The smaller side of spring is upside down, stand up the black spring holder), or check which part get stuck, try to adjust it by your hand.

2. Make sure the DC Frame Type Solenoid port is connected at the M1 port.

3. Check if the DC Frame Type and Me Orion is wired correctly, if not, tighten it by using screwdriver.

4. Supply 9V power to connect both sides of DC Frame Type Solenoid, (no positive and negative difference) and check if the DC Frame Type Solenoid can be attracted. If it can be attracted, then the DC Frame Type Solenoid indicates no issues.

5. Check out if LED RGB Strip beside the DC Frame Type Solenoid port is turn on while the hitting section moves to the specified place. If not, then upgrade the firmware. After update, it’s still don’t work, that means you need to exchange another Me Orion.

Q3: Why plug in the power, the stepper motor will spin on?

Answer: At the very beginning, the stepper motor needs to initialize, when the hitting section moves to the edge of limit switch, it will stop. If the hitting section won’t stop, then you need to check if the limit switch has been installed incorrect. You might connect the limit switch on adapter module SLOT 2, it should connect with port 6 of Me Orion.

Q4: Why the LED RGB strip isn't working?

Answer:

1.Firstly we need to update the firmware (A stable network is required.)

2. Make sure the LED RGB Strip connect with adapter module SLOT 1, and the adapter module RJ25 port need to connect the Me Orion Port 6.

3. Check if the Red LED light of adapter module is turn on, if not, it might a poor contact, try to rewiring.

Q5: Why hitting section won't back to the original position but slide to other positions after strike a note?

Answer:

1. Make sure you already installed the ultrasonic sensor and connect to the Port 3 of Me Orion.

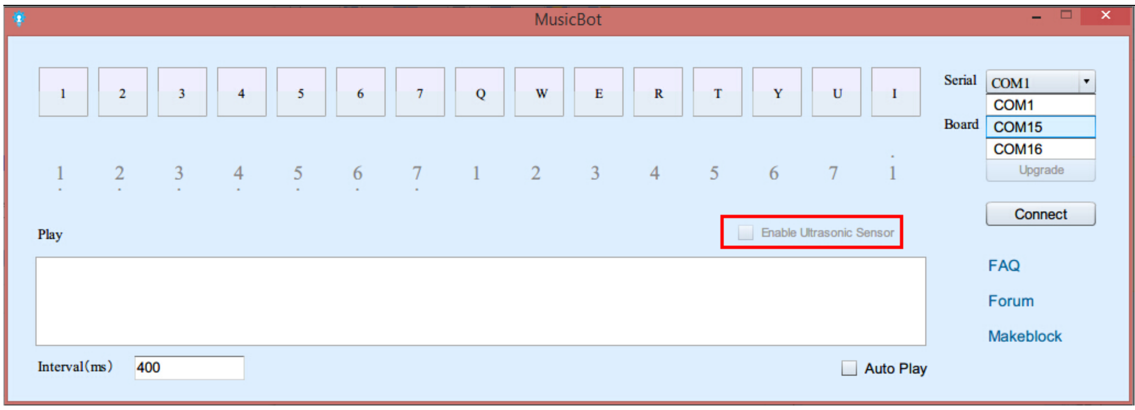
2. Make sure there's not obstacles in detection range of ultrasonic sensor. The obstacles will affect the running of hitting section.

Q6: What if the hitting section unable to reach the Xylophone?

Answer: Adjust the distance of hitting section and Xylophone until they can reach.

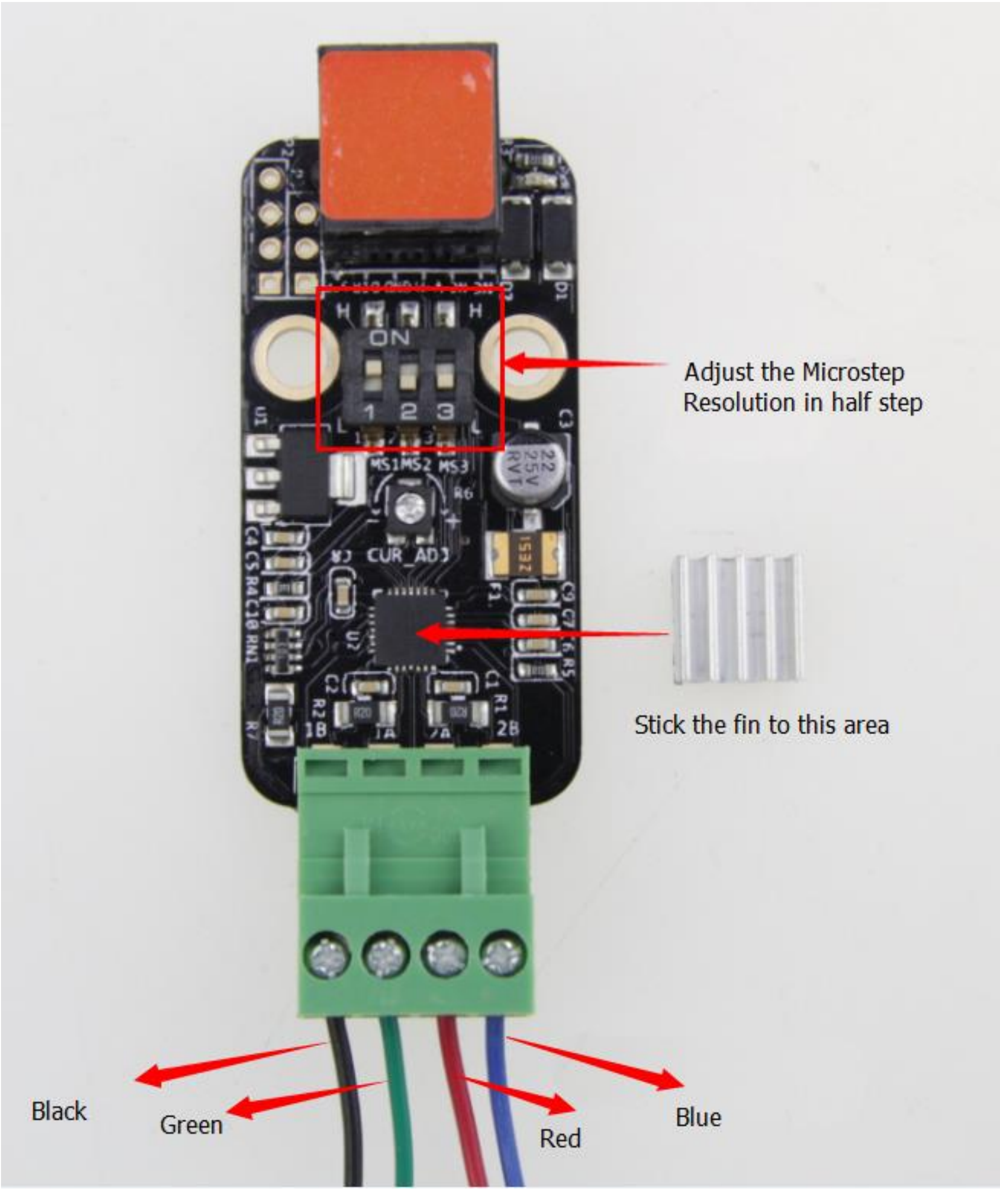
Q7: I can't control the Music Kit via ultrasonic sensor, what can I do?

Answer: You can select the Enable Ultrasonic Sensor box in up-computer software MusicBot as shown below:



Q8: When power on, the stepper motor rotates inversely, what can we do?

Answer: You might install on the wrong connectors. Please check the correct position as shown below:



Construct Your Dreams

Shenzhen Maker Works Technology Co., Ltd

Technical Support: tec-support@makeblock.com

www.makeblock.com

: +Makeblock : @Makeblock : @Makeblock